

## **Planning Models for Component-based Software Offerings under Uncertain Operational Profiles**

Mary Helander and Bonnie Ray  
Department of Mathematical Sciences  
IBM Watson Research Center  
Yorktown Heights, NY 10598

We present a modeling framework for allocating development or support effort among software components to meet a specified cost or reliability objective. The approach is based on knowledge of the linkage between the operational profile and the architecture of the system, but allows for uncertainty through the use of probability distributions to characterize usage. Stochastic optimization methods are used to obtain efficient solutions to the allocation problem for several different objective functions. The methodology is illustrated for service level planning related to a componentized software offering from IBM.